

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on September 22, 2003, and the references cited therewith.

Claims 15 and 22 are amended, and claims 27-41 are canceled; as a result, claims 1-26 and 42-45 are now pending in this application.

Information Disclosure Statement

Applicant submitted an Information Disclosure Statement and a 1449 Form on February 19, 2002, and a Supplemental Information Disclosure Statement and a 1449 Form on June 6, 2003. Applicant respectfully requests that initialed copies of the 1449 Forms be returned to Applicants' Representatives to indicate that the cited references have been considered by the Examiner.

Affirmation of Election

As provisionally elected by Applicant's representative, Bruce T. Neel, in a telephone conversation on August 13, 2003, Applicant elects to prosecute the invention of Group I, claims 1-26 and 42-45.

The claims of the non-elected invention, claims 27-41, are hereby canceled. However, Applicant reserves the right to later file continuations or divisions having claims directed to the non-elected inventions.

§112 Rejection of the Claims

Claims 15 and 22 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 15 has been amended to remove usage of the word "slight". This amendment is not intended to narrow the coverage of the claim. Rather, the new text is added to more clearly define the invention.

Claim 22 has been amended to re-word the recitation in claim 22 for a direct viewer and is not intended to narrow the coverage of the claim. Conner et al. (U.S. 5,124,818), as an example of usage in one particular context, uses the phrase “direct view” at col. 14, lines 38-39.

§102 Rejection of the Claims

Claims 1-8, 10, 14-26, 42 and 44 were rejected under 35 USC § 102(b) as being anticipated by Conner et al. (U.S. 5,124,818). Anticipation requires that every element of a claimed invention be shown in a single reference.

Independent claim 1 recites a first orientation layer to impart a first orientation direction to a first region of the liquid crystal material. Conner col. 9, lines 20-25, is cited by the Examiner as showing this element. This section of Conner describes a so-called “third panel” 16, which is one of several LCD panels 12, 14, 15, and 18 sandwiched between polarizers 20, 22, 24, 26, and 28 to form a basic display subassembly 10. Conner describes that third panel 16 is optional and may be included to increase contrast.

It is not clear from the Examiner’s arguments whether the third panel itself is being presented as an orientation layer or whether one of the polarizers is being presented as such. Regardless of which of the foregoing alternatives is being argued by the Examiner, this cited section of Conner does not explicitly discuss the imparting of an orientation direction to liquid crystal material. Instead, Conner discusses the factors that affect a panel’s spectral response for a given twist angle, namely its thickness and its optical refractive index anisotropy.

Applicant’s claim 1 further recites a second orientation layer to impart a second orientation direction to a second region of the liquid crystal material. Conner col. 9, Table II is cited by the Examiner as showing this element. However, Table II is a listing of ratios of $\Delta n d / \lambda^2$, which are described as approximating an LCD panel’s spectral response. It is not at all clear to Applicant how the Examiner is considering Conner to explicitly describe the impartation of orientation directions to a liquid crystal material.

Applicant respectfully submits that the basis for the Examiner’s position is required to be explicitly set forth in written argument, especially if any inherency argument is being relied upon. Otherwise, Applicant is not able to effectively respond to the Examiner’s basic argument in making this anticipation rejection.

The Examiner has further argued that certain limitations of claim 1 are taken to be product-by-process limitations and are not limiting. In particular, these alleged process limitations include the phrase “operable to receive incoming light” (emphasis added).

A “product-by-process” claim is one in which the product is defined at least in part in terms of the method or process by which it is made. *Atlantic Thermoplastics Co. v. Faytex Corp.*, 23 USPQ 2d 1481, 1488 (Fed. Cir. 1992). In order for claim 1 to be considered a product-by-process claim, there must be a process limitation in the claim that describes a process for making at least a portion of the product recited in the claim. The phrase “operable to receive incoming light” is describing a functional characteristic of the final, assembled liquid crystal display, not a process for making the liquid crystal display.

It is well established that functional limitations may be used in claims and that such limitations are not per se indefinite. A functional limitation in a claim defines something by what it does, rather than what it is. There is nothing inherently wrong with defining some part of an invention in functional terms.

Another alleged process limitation of claim 1 is the phrase “the first orientation direction and the second orientation direction are each rotationally offset from an optical mode of the liquid crystal display” (emphasis added). Again, this limitation does not describe a process for making the liquid crystal display system of claim 1. Instead, this phrase defines a structural relationship between first and second orientation directions. The word “offset” is an adjective that describes the relative positions of these orientation directions in the final, assembled liquid crystal display system. The reciting of a relative structural relationship between two elements of a claim is long-established structural claiming practice. The word “offset” does not even have a process connotation. *Cf., e.g., Hazani v. U.S. Int’l Trade Comm’n*, 44 USPQ 2d 1358, 1363 (Fed. Cir. 1997) (Hazani argues that the “chemically engraved” claims are product-by-process claims. We agree with the respondents, however, that those claims are best characterized as pure product claims, since the “chemically engraved” limitation, read in context, describes the product more by its structure than by the process used to obtain it.).

The remaining wording that the Examiner has alleged to be in product-by-process form merely gives additional meaning to the phrases “incoming light” and “optical mode”, and does not define a process for making some portion of the liquid crystal display system.

The Examiner has argued that the final structure of the product is to be examined for patentability, and not the patentability of the process used to make the product. As discussed above, Applicant does not believe that a product-by-process interpretation is appropriate for claim 1. However, MPEP 2113, which is cited by the Examiner, makes clear that the structure implied by the process steps should be considered when assessing the patentability of a product-by-process claim over the prior art. Even if the Examiner's assertion that the above limitations are process steps were considered to be correct, the Examiner has improperly failed to give any weight to the structure implied by the alleged process steps.

For example, for the "operable to receive incoming light" limitation discussed above, it is eminently clear that the final structure of the liquid crystal display will have the functional property of being "operable to receive incoming light". Also, for the phrase "the first orientation direction and the second orientation direction are each rotationally offset from an optical mode of the liquid crystal display", the final structure of the liquid crystal display system will have a rotationally offset orientation directions as recited in claim 1.

Even if the Examiner's product-by-process assertion were accepted, it is clearly improper to fail to give any consideration at all to the structural aspects resulting from these so-called process limitations. Applicant requests that for purposes of simplifying prosecution of this application that the Examiner turn from this product-by-process argument to a more straightforward examination based on an apparatus claim structure.

As part of his examination, the Examiner has apparently failed to give any consideration to the phrase "the first orientation direction and the second orientation direction are each rotationally offset from an optical mode of the liquid crystal display" as recited by claim 1. Applicant briefly discusses this particular phrase for purposes of advancing the prosecution and allowance of claim 1.

As discussed above, Applicant does not believe that the Examiner has cited a section of Conner that even explicitly discusses the impartation of orientation directions. However, for the sake of argument, even if Conner were considered to provide some discussion of the impartation of orientation directions to a liquid crystal material, Conner clearly does not discuss the rotational offset of first and second liquid crystal orientation directions. Instead, Conner is more generally directed to a stack of LCDs with opposite twist from a main LCD to act as

compensators in improving contrast. The contrast improvement as described in Conner is accomplished by modifying $\Delta n d$ of the liquid crystal in the passive regions (where Δn is the birefringence of the liquid crystal material and d is the cell thickness). Conner's described improvement approach does not at all include a description of the rotational offset of liquid crystal orientation directions as recited in claim 1.

Applicant's independent claim 1 recites that "the first orientation direction and the second orientation direction are each rotationally offset from an optical mode of the liquid crystal display in which the polarization direction of the incoming light divides a twist angle defined by the first orientation direction and the second orientation direction". For the reasons discussed above, the foregoing phrase should be considered to provide a structural limitation in claim 1 that should be considered in determining patentability. When this is done, Conner clearly does not identically describe this element as is required when making an anticipation rejection, and further does not even provide any teachings, suggestions, or other discussion, regarding rotationally offset liquid crystal orientation directions. Accordingly, claim 1 is believed allowable.

Applicant's remaining independent claims 42 and 44 each recite that "the first orientation direction and the second orientation direction are each rotationally offset". For the reasons discussed above for claim 1, claims 42 and 44 are also believed allowable.

All other rejected claims depend from one of claims 1, 42, or 44 and are believed allowable for the reasons discussed and further for their additional recited limitations.

§103 Rejection of the Claims

Claims 9, 11-13, 43 and 45 were rejected under 35 USC § 103(a) as being unpatentable over Conner et al. in view of Melnick et al. (U.S. 6,348,959). Melnick discusses the solution to a different problem than that of Applicant. In particular, Melnick describes a method to keep the non-active border area (next to the active area) dark all of the time in normally white, reflective LCOS displays. Melnick does not discuss increasing the contrast from the active area of the display, because this is not the problem that Melnick is addressing.

The Examiner makes reference to col. 6, lines 60-62 of Melnick, which describes LC alignment layers (orientation means) with respect to the direction of polarization. Melnick here further describes the direction of polarization is along the direction of the bisecting line between

the LC orientation direction, and describes a range of twist angles between 50 and 68 degrees. However, Melnick does not describe any rotational offset of these orientation directions and does not associate any such offset with the improvement of photopic contrast. Indeed, in this section Melnick is citing U.S. Patent No. 5,490,003 by Van Sprang, which is the same patent cited for reference purposes on page 9, lines 7-11, of Applicant's specification, and which Applicant's claims distinguish over.

All claims in this rejection depend from one of Applicant's claims 1, 42, and 44 and are believed allowable for the reasons discussed above. In particular, neither Conner nor Melnick teaches or suggests that "the first orientation direction and the second orientation direction are each rotationally offset". Thus, the combination of Conner and Melnick does not contain any such teaching or suggestion. Therefore, all rejected claims are believed allowable for the foregoing reasons and further for their additional recited limitations.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. Any arguments or assertions of the Examiner not addressed above are considered moot in light of Applicant's arguments above.

The Examiner is invited to telephone Applicant's attorney (602) 256-4429 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-2412.

Respectfully submitted,

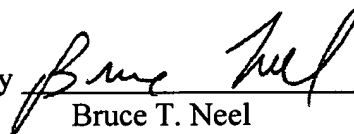
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 21 day of January, 2004.

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